

4/7/5

DIALOG(R)File 351:Derwent WPI

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WPI Acc.No: 2002-195599/ 200225

New bromofluorinated monomers, their copolymers and bromosulfonated fluorinated elastomers with very low glass transition for use in fabrication of e.g. hydrogen fuel cell membranes produced by crosslinking them

Patent Assignee: HYDRO-QUEBEC (HYDR-N); AMEDURI B M (AMED-I); ARMAND M (ARMA-I); BOUCHER M (BOUC-I); MANSERI A (MANS-I)

Inventor: AMEDURI B M; ARMAND M; BOUCHER M; MANSERI A

Number of Countries: 097 Number of Patents: 006

Patent Family:

Patent No Kind Date Applicat No Kind Date Week

WO 200196268 A2 20011220 WO 2001CA878 A 20010612 200225 B

CA 2312194 A1 20011213 CA 2312194 A 20000613 200225

AU 200168869 A 20011224 AU 200168869 A 20010612 200227

EP 1289915 A2 20030312 EP 2001947073 A 20010612 200320

WO 2001CA878 A 20010612

US 20030181615 A1 20030925 WO 2001CA878 A 20010612 200364

US 2003296833 A 20030306

JP 2004502786 W 20040129 WO 2001CA878 A 20010612 200413

JP 2002510414 A 20010612

Priority Applications (No Type Date): CA 2312194 A 20000613

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 200196268 A2 F 72 C07C-021/02

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA
CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN
IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ
PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR
IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

CA 2312194 A1 F C07C-021/18

AU 200168869 A C07C-021/02 Based on patent WO 200196268

EP 1289915 A2 F C07C-021/02 Based on patent WO 200196268

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT
LI LT LU LV MC MK NL PT RO SE SI TR

US 20030181615 A1 C08F-004/34

JP 2004502786 W 108 C07C-021/18 Based on patent WO 200196268

Abstract (Basic): **WO 200196268** A2

NOVELTY - New bromofluorinated monomers, methods of preparing

copolymers of them with brominated trifluorovinyl monomers optionally containing a sulfonyl group, the copolymers produced and elastomers prepared by crosslinking them.

DETAILED DESCRIPTION - The new compounds are of Formula (I).
 $F_2C=CFX(CY_2)_nBr$ (I)

X=H, null;

Y=H, F;

n=integer 0-10.

Preferred forms are of Formula (II), (II') and (II). $F_2C=CF(CH_2)_nBr$
(II)

$F_2C=CFBr$ (II')

$F_2C-CF(CH_2)_2Br$ (II)

Other monomers used are of Formula (III1), (III2) and (VI).

$F_2C=CFORF_1$ (III1)

$F_2C=CFORF_2-G$ (III2)

$FCX=CYZ$ (VI)

$RF_1=C_nF_{2n+1}$;

$RF_2=C_nF_{2n}$;

G= SO_2FCO_2R , $P(O)(OR')$;

R= CpH_{2p+1} ;

p=integer 0-5;

R'=H, 1-5C alkyl;

X, Y, Z=H, F, Cl, C_nF_{2n+1} ;

X, Y, and Z are not simultaneously F.

Random copolymers produced are of Formula (IV), (V), (VII) and (VIII).

$-(-(CF_2-CFBr)_n(-(CF_2CF(ORF-G)))_m)_p-$ (IV)

$-(-(CF_2-CF(C_2H_4Br))_q(-(CF_2CF(ORF-G)))_r)_s-$ (V)

$-(-(CF_2(CFBr)_a-(CH_2CF_2)_b(-(CF_2CF(ORF-G)))_c)_d-$ (VII)

$-(-(CF_2CF(C_2H_4Br))_e-(CH_2CF_2)_f-CF_2CF(ORF-G))_g)_h-$ (VIII)

RF=RF₁, RF₂;

m, n, q, r=integer;

n/m, q/r=2-23;

p, s=10-300;

a, b, c=integer;

b/a=0.1-15;

b/c=1-20;

d=15-150.

When RF is RF₁, G is not present.

a fluorinated copolymer is prepared by radical copolymerization (I) with (III1) or (III2), (II') with (III1) or (III2) to give (IV), (II) with (III1) or (III2) to give (V) and a method of copolymerization comprising the reaction of (II') with (III1) and (III2) (VI) to give (VII) and (II) with (III1) or (III2) and (VI) to give (VIII). The copolymers are crosslinked to yield a bromosulfonated fluorinated elastomer. An INDEPENDENT CLAIM is included for a method of

crosslinking the sulfonyl groups of the claimed elastomers in the course of which at least some of the crosslinking bonds carry an ionic charge and which comprises contacting the polymer with a crosslinking agent to permit the reaction of two sulfonyl groups on adjacent polymer chains.

USE - The elastomers are used for the fabrication of membranes, polymer electrolytes, ionomers, parts of hydrogen or methanol fuel cells, to obtain sealing joints, torus joints, flexible hoses, pipes, pump bodies, diaphragms, piston heads for use in the aeronautical, petroleum, motor, mining and nuclear industries and for plasturgy.

ADVANTAGE - The copolymers have a very low glass transition temperature and produce elastomers having good resistance to acids, petroleum, and fuels and good handling properties. Tetrafluoroethylene is not used in their preparation.

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Patent No	Kind	Date	Applicat No	Kind	Date	Week
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WO 200196268	A2	20011220	WO 2001CA878	A	20010612	200225 B
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CA 2312194	A1	20011213	CA 2312194	A	20000613	200225
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AU 200168869	A	20011224	AU 200168869	A	20010612	200227
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EP 1289915	A2	20030312	EP 2001947073	A	20010612	200320
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			WO 2001CA878	A	20010612	
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US 20030181615	A1	20030925	WO 2001CA878	A	20010612	200364
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			US 2003296833	A	20030306	
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JP 2004502786	W	20040129	WO 2001CA878	A	20010612	200413
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			JP 2002510414	A	20010612	
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Priority Applications (No Type Date): CA 2312194 A 20000613

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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WO 200196268	A2	F	72	C07C-021/02	
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Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA

CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN

IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ

PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR

IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

CA 2312194	A1	F		C07C-021/18	
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AU 200168869	A			C07C-021/02	Based on patent WO 200196268
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EP 1289915	A2	F		C07C-021/02	Based on patent WO 200196268
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Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT

LI LT LU LV MC MK NL PT RO SE SI TR

US 20030181615	A1			C08F-004/34	
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JP 2004502786	W	108		C07C-021/18	Based on patent WO 200196268
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$-(CF_2-CF(C_2H_4Br))_q-(CF_2CF(ORF-G))_r-s$ (V)

$-(CF_2(CFBr))_a-(CH_2CF_2)_b-(CF_2CF(ORF-G))_c-d$ (VII)

$-(CF_2CF(C_2H_4Br))_e-(CH_2CF_2)_f-CF_2CF(ORF-G))_g-h$ (VIII)

RF= RF_1 , RF_2 ;

m, n, q, r=integer;

n/m, q/r=2-23;

p, s=10-300;

a, b, c=integer;

b/a=0.1-15;

b/c=1-20;

d=15-150.

When RF is RF_1 , G is not present.

a fluorinated copolymer is prepared by radical copolymerization (I) with (III1) or (III2), (II') with (III1) or (III2) to give (IV), (II) with (III1) or (III2) to give (V) and a method of copolymerization comprising the reaction of (II') with (III1) and (III2) (VI) to give (VII) and (II) with (III1) or (III2) and (VI) to give (VIII). The copolymers are crosslinked to yield a bromosulfonated fluorinated elastomer. An INDEPENDENT CLAIM is included for a method of

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